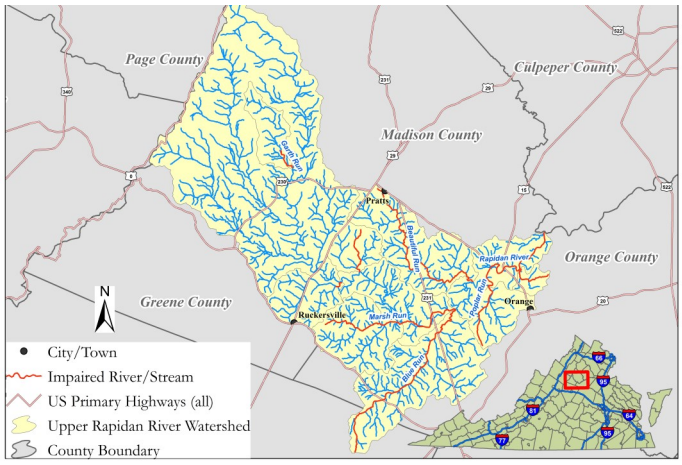
Project Location and Background



The Upper Rapidan River watershed spans portions of Virginia's Albemarle, Greene, Madison, and Orange counties in the Rappahannock River Basin. The TMDL watershed comprises ten impairment watersheds and totals approximately 157,262 acres with land uses predominated by forest (60%) and pastureland (32%). Blue Run and Rapidan River #1 were listed as impaired on Virginia's *2002 Section 303(d) Total Maximum Daily Load (TMDL) Priority List and Report* due to violations of the state's water quality standards for fecal coliform bacteria. Marsh Run and the Unnamed Tributary (UT) to Rapidan River #1 were added in 2004. TMDLs for those four watersheds were completed in April 2007 as part of the Bacteria TMDL Development for the Rapidan River Basin. Rippin Run, Beautiful Run, Rapidan River #2 and UT to Rapidan River #2 were listed as impaired in 2012; Garth Run and Poplar Run were listed in 2014. Those impairments are nested within the TMDL-developed watershed. A TMDL implementation plan addressing all segments was completed in October 2015, and the implementation project started in July 2016.

Implementation Highlights

The Upper Rapidan River agricultural and residential septic implementation projects are administered by the Culpeper Soil and Water Conservation District (CSWCD). The table to the right shows BMPs implemented since the project began in July 2016 and overall implementation goals for the project area. Please note that not all BMP goals included in the implementation plan (e.g., pet waste BMPs) are shown in the table, which focuses on the BMP goals that are being pursued with implementation projects.

Most notably, nearly 49 miles of stream exclusion fencing have been installed, 59 percent of the IP goal. Another 32 miles of stream exclusion fencing has been maintained to further the environmental benefit. The 233 acres of permanent vegetative cover established on cropland far exceeds the IP goal, as does the implemented cover crop acreage.

(*continued on page 2*)

Table 1: Upper Rapidan River BMP Summary: January 2016 — June 2019

Control Measure	Units	Goal	Installed	%
Agricultural				
Stream Exclusion Fencing	F	432,600	257,339	59
Stream Exclusion Fencing	S	314	41	13
Stream Exclusion Maintenance	F	N/A	172,922	N/A
Riparian Buffers	A	39,500	203	<1
Improved Pasture Management	A	49,361	3,839	8
Sediment Retention, Erosion, or Water Control Structure	A	11,464	0	0
Permanent Vegetative Cover on Cropland	A	43	233	542
Reforestation of Erodible Crop and Pastureland	A	43	0	0
Cover Crops	A	3,266	5,748	176
Residential Septic				
Septic Tank Pump-out	S	1,713	148	9
Connection to Public Sewer	S	30	0	0
Septic System Repair	S	1,068	16	2
Septic System Installation	S	569	11	2
Alternative Waste Treatment	S	46	0	0

A = Acres, F = Linear Feet, S = System; Note: BMP counts only include 319 -funded and state VACS. NRCS EQIP funded practices are not included.

The Virginia Nonpoint Source Management Program: The Virginia NPS Management Program is managed by the Virginia Department of Environmental Quality (DEQ) and is funded, in part, through grants from the U.S. Environmental Protection Agency, under the Clean Water Act Section 319(h). For more information regarding Virginia's Nonpoint Source Management Program, please visit us on the web at: http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/NonpointSourcePollutionManagement.aspx . An electronic copy of this report can be found here: http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/TMDL/TMDLImplementation/TMDLImplementationProjects.aspx General NPS Program questions? email: npsgrants@deq.virginia.gov

Implementation Highlights— Continued

Between July 2018 and June 2019, 12 stream exclusion fencing systems were installed, protecting 44,629 feet of stream. Other agricultural projects completed during this period included maintenance of 79,721 feet of stream exclusion fencing, 1,110 acres of small grain cover crop, and 77 acres of permanent vegetative cover crops. There continues to be significant interest in agricultural BMPs, strongly suggesting that implementation goals outlined in the current funding agreement will be achieved or exceeded. This is especially noteworthy given there have previously been numerous BMPs installed in this watershed under an increased incentive program offering 100% cost-share on select practices several years ago.

Significant strides have been made in implementation of the residential septic program BMPs. A high level of participation is in part due to this grant providing the first septic system cost-share funding available within the watershed. Stimulated by extensive residential septic outreach conducted in the watershed, including direct postcard mailings to all rural delivery boxes, letters to rural churches in areas with steep or poorly drained soils, and participation in local (community- and school-based) events, between July 2018 and June 2019, 47 septic tank pump-outs, eight septic system repairs, and four conventional septic system replacements were completed in the watershed.

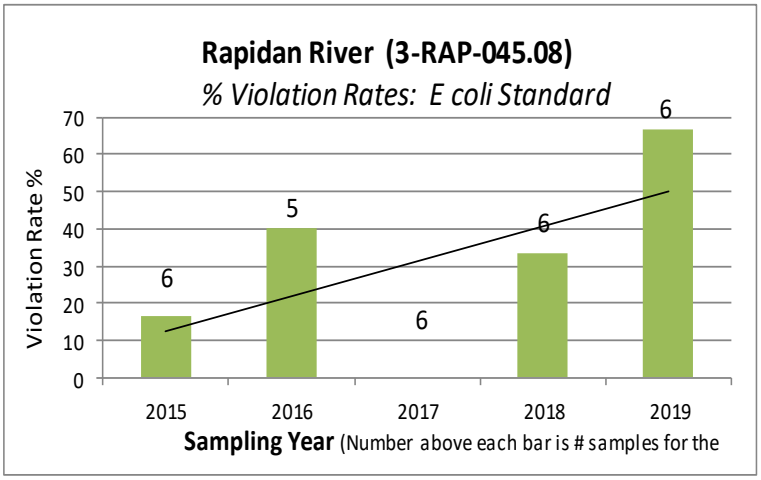
Bacteria reductions from BMP installations are summarized in Table 2 below.

Period	Pathogens (Coliform) (CFU)
Aug. 2016—June 2019	1.14E+16

Table 2: Pollution Reductions for Upper Rapidan River Watershed

Water Quality Monitoring Results

Water quality data collected by DEQ for the period of 2013 through 2019 were analyzed to determine *E. coli* violation rates in the project area relative to the water quality standard of 235 cfu/100 mL and determine the impact of BMPs implemented in the project area on violation rates and associated long-term trends, if any, in water quality. The bar graph at right shows the percent violation rate for samples collected annually at monitoring station 3-Rap-045.08, which did not meet the water quality standard of 235 cfu/100 mL. The number of samples collected each year is shown above each bar. The linear regression fitted to the data showed a fairly constant level in violation rates for 2015-18, before the rate jumped to 67% in 2019 for reasons unclear at this time. Because the implementation project only started in 2016, monitoring over a longer period of time with consistent trends will be needed to corroborate water quality changes.



Graph1: *E.coli* data for Rapidan River (Station 3-RAP-045.08), 2015 -2019

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